2006

Container development strategy of Tianjin port

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CONTAINER DEVELOPMENT STRATEGY OF TIANJIN PORT

By

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A research paper submitted to the World Maritime University in partial Fulfillment of the requirements for the award of

MASTER OF SCIENCE

(INTERNATIONAL TRANSPORT AND LOGISTICS)

2006

DECLARATION

I certify that all the material in this research paper that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this research paper reflect my own personal views, and are not necessarily endorsed by the University.

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ACKNOWLEDGEMENT

I finished this dissertation with the help of my supervisor Professor Zong Beihua. At the phase of dissertation researching and writing, Professor Zong gave me lots of instructions and help. Her earnest and precise teaching attitude, wide and quintessential knowledge, virtuous characters touch me deeply. With her help, I finished my dissertation with less crooked road. So at the completing of my dissertation, I will express my sincere thankfulness and grand respect to my honorific teacher—Professor Zong Beihua.

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ABSTRACT

Title of Research paper: **Container Development Strategy of Tianjin Port**

Degree: **MSc**

With the development of economic globalization, Port, which is regarded as the pivot of sea and land, takes increasingly important role in regional economy. In my country, 3 big port clusters shape in costal region. They are Bohai rim's economy circle port cluster, Yangtze River delta economy circle port cluster and Pearl River delta economy circle port cluster. Of these three big port clusters, Shanghai port's pivot status in Yangtze River delta is unshakeable by its own strength and its strong hinterland. In Pearl River delta, Xianggang port's cock status can't be suppressed by Shenzhen port and Guangzhou port in short period by right of its own strength. But in Bohai rim's port cluster, Qingdao port, Tianjin port and Dalian port's power is pretty much the same. The competition within these 3 ports is very serious. At the same time, the competition with oversea port is also very serious and a large proportion of cargoes in the north of china are transferred at oversea. If we let this "transfer at oversea" situation going on, all of the north port of china will become feeder port of Pusan port. This outcome is not hoped by china. So establishing china north international shipping center, rationalizing branch line and main line, complementing advantage and disadvantage and taking part in competing for becoming north container pivot port is of great importance. Under this situation, as the biggest all-around port, what should Tianjin port do? Just aiming at this, I carry through analyzing and container throughput prediction. Then at the end paper, I will give Tianjin port's container development strategy.

KEYWORDS: Container, Port, Competition, Throughput, Strategy

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LIST OF ABBREVIATIONS

EDI	Electronic Data Interchange
CO	Corporation
TEU	Twenty-Feet Equivalent Units
DWT	Dead Weight Tonnage
DCT	Dalian Container Terminal
GDP	Gross Domestic Product
CPC	Communist Party of China
US	United States
WTO	World Trade Organization
LOA	Length Overall All
EU	European Union
R&D	Research and Development
IT	Information Technology
NY	New York
NJ	New Jersey
LB	Long Beach
LA	Los Angles

Chapter 1 Introduction

1.1 The background and significance of topic choosing

With the development of economic globalization, Port, which is regarded as the pivot of sea and land, takes increasingly important role in regional economy. In my country, 3 big port clusters shape in costal region. They are Bohai rim's economy circle port cluster with the center of Tianjin port, Dalian port and Qingdao port; Yangtze River delta economy circle port cluster with the center of Shanghai port and Ningbo port; Pearl River delta economy circle port cluster with

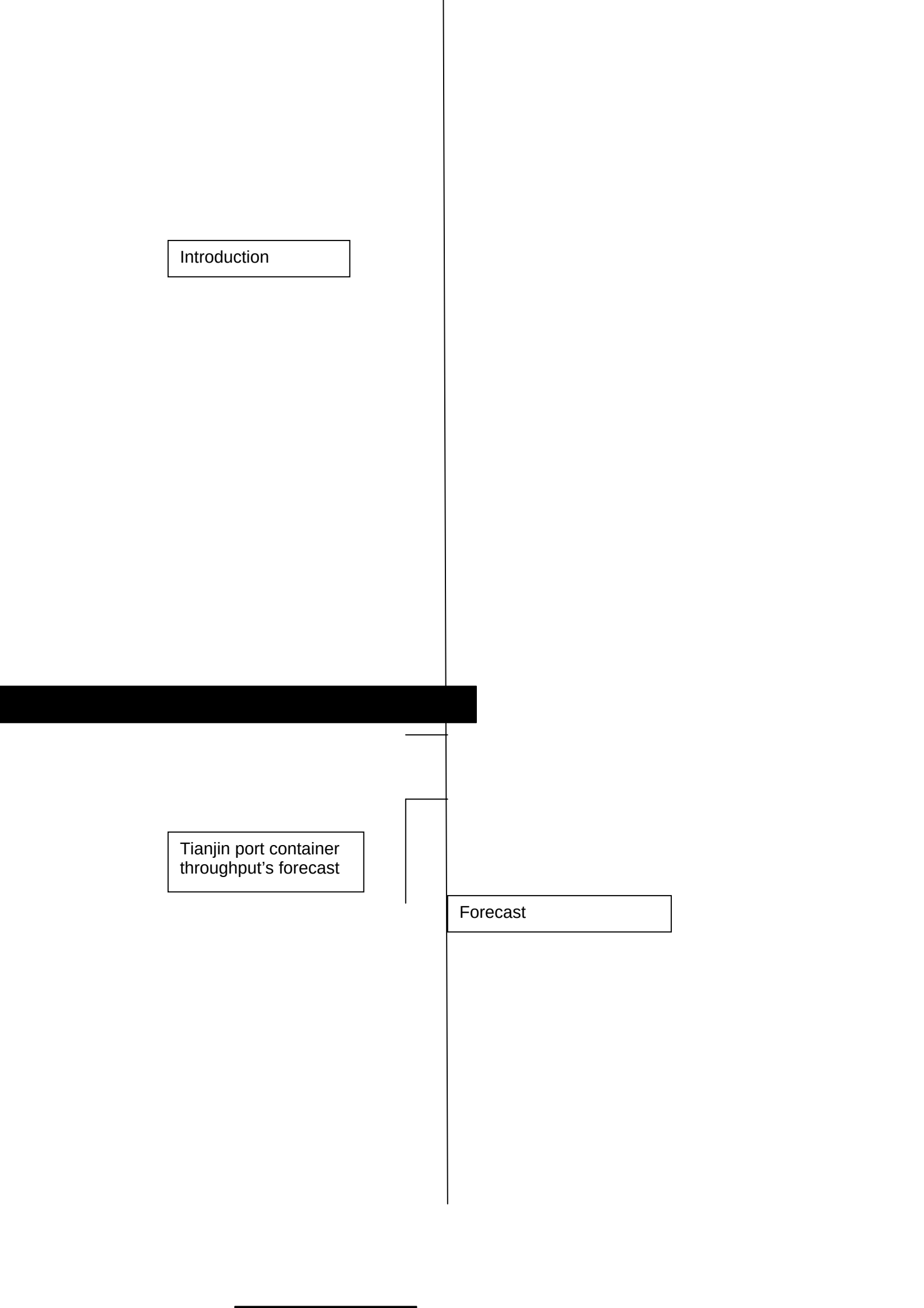
establishing china north international shipping center, rationalizing branch line and main line, complementing advantage and disadvantage and taking part in competing for becoming north container pivot port is of great importance. China's economy development needs establishing a pivot port in the north of china to compete with Pusan port and Kobe port and scramble back the losing transit cargoes. This will not only largely increase china's port scale but also will play very important role in costal cities' development.

1.2 Dissertation's contents and methodology

Under nowadays' serious competition, what should Tianjin port—the biggest all-around port in the north of china do? Just aiming at this, my paper will focus on analyzing Tianjin port's competition situation, strategy and forecasting Tianjin port's container throughput. At the end of my dissertation, I hope to find a good strategy for Tianjin port's development.

The text of my dissertation contains 6 chapters. Chapter one is a simple description of Tianjin port's current condition. Chapter two mainly describes the necessity of establishing china's northern container pivot port. Chapter three is qualification analysis of establishing Tianjin port as an international container pivot port. In this chapter, I mainly analysis the strength and weakness of Tianjin port in northeast Asia and Bohai rim. In chapter four I carry through forecasting about Tianjin port's container throughput. In the last chapter, I will find the strategy suitable for Tianjin port.

1.3 The outline of dissertation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Forecast

1.4 Literature review

1.4.1 International container pivot's forming and development

1.4.1.1 International container pivot's definition and formation requirement

ⅰ The definition of international container pivot port

International container pivot port refers to the port that has dense sea route, deepwater channel, frequent collecting and distributing network and related industries served for container shipping.

The above definition implies that international pivot port is composed of 2 parts. One is infrastructure and the other is software environment service system. The infrastructure refers to berths, channel, collecting and distributing network, modern transportation information system and some other relevant support facilities that complied with current and the future need. The software environment service system refers to the service departments served for international container transportation like customers, products testing, sanitation testing, safety inspection, ship inspection, plant & animal inspection and some other departments on behalf of government law execution departments. It also includes service institution like shipping agency, freight forwarder, shipping market exchange and admiralty court and so on.

ⅱ The contribution factor of international container pivot port's formation

There is a historic process of the formation of international container pivot port. All of the nowadays' well-known international container pivot port are world economy center port cities. They all firstly developed beginning with economy and trade, then became the international pivot port and then developed into international container pivot port. So we can conclude that worldly and regional economy and trade's development stimulate the formation of international pivot port. From the end of 18^{th} century to the beginning of the 19^{th} century, industry revolution made England firstly became the growth center of world economy, subsequently, it expended to Europe

continent and London became the international pivot port. From the end of 19th century to the beginning of the 20th century, in the process of world economy growth center transferred to America from west Europe, Rotterdam and New York became the new international pivot port one after another. Since 1960, countries in northeast Asia and Japan's economy booming made world economy growth center transferred to Asia-Pacific region. Therefore, Hong Kong, Singapore became the international pivot port. From this, we can see that the formation of international pivot port has close relationship with regional economy's development and foreign trade's development. The reason can be explained by a simple reason. The development of economy leads to trade development, but trade need transportation. Therefore, international shipping ports formed. In consequence, we can conclude that on one side, international pivot port is the demand for international economy and trade's high-speed development, one the other side, international pivot port's development is the important basic requirement for world or regional economy and trade's development.

iii Requirements of international container pivot port

The first requirement is natural condition. The international pivot port should have deep-water channel and deep-water berths complied with the current and future need and developed collecting and distributing network. Besides, port should exploit as many sea routes as possible to explore the radiating area for international shipping.

The second requirement is that the port should have huge hinterland to support sufficient cargoes. For instance, New York's direct hinterland is New York and New Jersey. The indirect hinterland is northeast, middle and western industry regions as well as North America and South America. Wide economy hinterland makes New York the places full of big exporters from America, Canada, Argentina, South America, Australia and Africa and because of that New York has become the biggest international trade market and economy center in the world. So huge hinterland is the requirement for New York becomes the international pivot port.

The third requirement is having favorable location condition. The best example is Singapore. Singapore is located in the middle of sea route of Europe and Asia-Pacific region. Favorable location condition makes it the best choice for international pivot port of transshipment.

The fourth requirement is developed and healthy shipping market, dense shipping route and huge volume of shipment. For example, Hong Kong international pivot port has business transaction with more than 100 countries and 460 ports in the world. More than 300 shipping companies set up headquarters, subsidiary companies or agency at Hong Kong.

1.4.1.2 The function and development of international container pivot port

There experienced 3 development processes from international pivot port to international container pivot port. The first generation of international pivot port is transshipment ports. Its function is simplex, only cargoes transportation and collection and distribution. The second generation of international pivot is the port between international pivot pot and international container pivot port. It was in a transformation phase. The transformation completed after the 2nd world war. At that time, the main function of port also includes value added service asides from efficient transportation and collection and distribution. Since 1980s, international pivot port has completed the transformation to international container pivot port. The main function of ports has developed to resource allocation from logistic center. The ports have become the new generation container pivot ports that integrate cargoes, capital, information and technology circulation.

There are 4 main functions of international pivot port. The first one is transportation function. The transportation function of international pivot port is demonstrated at that International container pivot port mainly provides global and cheaply door to door transportation service for inland economic hinterland or transshipment service

for international radiating economic hinterland. Transportation function is the most basic function of international container pivot port. The second one is logistic service function. Ports are becoming logistic service center. Its function extends to inland such as whole selling, distributing, warehousing, and free trade zone, providing compositive logistic service for ships, cars, trains and warehouse. Ports have become the service center of multimodal transportation and the transshipment point of high value-added logistic. The third one is business function. The development of international container pivot port not only laid foundation for international trade and at the same time it promotes the development of international trade. So international shipping center and international trade center is always interactive supplement. The fourth one is information managing function and information releasing function. Modern pivot port is based on EDI system and then developed into regional information center gradually. Therefore, the development of international container pivot port not only laid foundation for international trade and at the same time it is a very important stimulating factor for international trade.

1.4.2 Port economy and china ports' sufferings

Wangwei said from china's port— Worry behind blossom, although Chinese port appears booming quickly, the actual competition ability is not strong enough compared with international hub port. He pointed in international shipping transfer-cargoes take a high proportion. But china is lack of this kind of cargoes. Too many ports in the same region, resources configured unreasonably and over competition are the main reasons, which weaken the competition power of china's port.[1]

Cao zhongxi points that china's ports exist a lot of weakness while flourishing, especially in managing and operating in integration and optimization among ports. China's ports have the tendency of pursuing number but not profit. For example, in recent years, shipping condition is becoming better, Freight rate increase largely.

[1] http://wangweiciw.blog.ccidnet.com/blog/ccid/do_showone/tid_21959.html

Ports also make full use of this chance increasing port charges. But china's port seems impervious. From this, we can see that china's port take more attention on number than profit. Mr Cao also regards that the main pressure on china's port is not from nearby ports like Korean but from itself. Every port in china wants to become hub port. It is a good thing. But if the relationship betweens port is not harmony, it will be very dangerous.[2]

Ports economy is regional economy which combines shipping, ports, shipping related industries, business, trade, and touring. As a carrier of information changing between within region and outside region, port economy has become the main power for promoting regional economy. But what we should pay attention to is that globalization also brings in a lot of difficulties and challenges to ports. Ships are becoming bigger and professional. International shipping Co's alliance is becoming more popular.[3] So ports within the same region should also in search of cooperation but not competing seriously, fighting for each other which leads to internecine and unable to compete with ports outside region or abroad.[4]

1.4.3 Competitive cooperation theory

Competitive Cooperation first brought forward by Professor Nalebuff in Yale and Professor Brandenburger in Harvard. It is a concept using describing phenomenon including both competition and cooperation. The ultimate purpose of competition is win-win. Win-win strategy demands us get rid of the traditional philosophy of "not win is loss". Win-win strategy calls for cooperation in order for more benefit. That's not to say that competitive cooperation deny competition. It just aims avoiding over-competition and virulent competition and keeps moderate and rational competition. The members of alliance can get more benefits that can't be got by Win-Lose strategy. Cooperation will not only avoid ports' over competition within the same

[2] Cao zhongxi, 2005, pp. 7-9
[3] Chen fuxiang, 2005, pp.22-23
[4] Chen fuxiang, 2005, pp.22-23

port cluster, but also can increase port cluster's competitive power compared with other port cluster hence increasing ports' stimulating role in regional economy.[5]

[5] Fangmin, 2005, pp. 26-28

Chapter 2 Tianjin port's survey and current condition

2.1 Summarization of Tianjin port's current condition

2.1.1 Natural condition of Tianjin port

Tianjin port is located in Tanggu that is about 170 km away from Beijing and 50 km away from Tianjin. Tianjin port is not only a very important international port in the north of china and sea gate of Beijing which is the capital of china but also the port in the middle of Bohai rim nearest to north china and north-west areas. Tianjin port's hinterland mainly includes two municipalities of Beijing and Tianjin and most provinces and municipalities of north china, north-west areas. It also includes 8 provinces--Heibei, Shanxi, Inner Mongolia, Shanxi, Gansu, Qinghai, Xinjiang, Ningxia and some areas of Henan and Shandong provinces. It owns abundant resources like salt, coal, oil, mine and so on. At present, Tianjin port's overall property has reached 12.4 billion Yuan, and has already have 140 berths including 8 appropriated berths which can berth fifth generation and 6^{th} generation container ships.

There are a lot of railways and highways in Tianjin port's hinterland. So it belongs to the transportation-developed region in china. The railway in the port areas connects every area's hinterland through Tianjin port's rail pivot. Among Tianjin's rail traffic network, there has already existed Beijing-shanghai railway line, Beijing-Shanhaiguan railway line, Jinji railway line and Jingqin railway line. In the roadway aspect, the road transportation line composed by Beijing-Haerbin line, Beijing-Fuzhou line, Shanguang line and Jintong line closely connected with hinterland. The

developed collecting and distribution network provides favourable condition to cargoes' circulation and Tianjin port's further development. At the same time, it is also beneficial to the construction of Tianjin port's container logistic center.

2.1.2 Current container development condition of Tianjin port

In the year of 2005, Tianjin port completed cargoes throughput 240 million tons and container throughput 4.8 million TEU. They respectively increased by 1.5% and 1.8%. Table 2-1 shows Tianjin port's container throughput and growth rate in recent years. At present, Tianjin port owns 101 productive berths and among them, there are 55 deep-water berths and 15 container berths. The design container throughout capability is 3.55 million TEU. By improving efficiency and exploiting potentials, now the real container throughput capability reached 5 million TEU in Tianjin port.

Table 2-1 Tianjin port's container throughput and growth rate from 2001 to 2005

Tabulation unit: 10 thousands TEU

Year	2001	2002	2003	2004	2005
Throughput	201	240	301	381	480
Growth Rate	1.194	1.19403	1.254167	1.265781	1.259843

Source: Arrange on my own according to statistic materials in custom

According to constructing china's north container pivot port, Tianjing port pays great attention on the construction of waterway engineering in recent years. In July of 2003, the first phase of Tianjin port's 150.000 tons waterway engineering that invested 180 million Yuan completed timely. Tianjin port stepped forward to world-class deep-water port. This project widen the 100.000 tons waterway from previous 210 meters to after 260 meter while the design water depth and waterway length still keep -14.8 meters and 28.8 km. After the widening of waterway, Tianjin port's capability in navigation and level of bi-directional transportation ships will improve further. 150.000 tons ships can go in and out of the port after unloading some portion

of goods and 6th generation container loaded ships can go in and out of the ports. The 4th generation container ships, 70.000 tons bulk carrier and 20.000 crude ships can navigate bi-directional. 100.000 tons crude ships and 10.000 tons ships can navigate bi-directional. In June of 2005, the second phrase of Tianjin port's 150.000 tons waterway engineering which invested 370 million Yuan completed on time. After the completion of second phase of engineering, the depth of waterway has reached -17.2 meters and the width has reached 310 meters. Now, 150.000 tons ships can go in and out of the ports freely, the 5th and 6th generation container ships can go in and out of the ships bi-directional, 200.000 tons ships can go in and out of port taking the tide. The completion of the second phrase of Tianjin port's 150.000 tons waterway engineering signify that Tianjin port has gotten ride of disadvantage of fairway depth and Tianjin port now is able to satisfy the deep water and large scale trend of container ships.

At the time of constructing the waterway engineering, some other important construction projects are under construction too. In the following 3 to 5 years, Tianjin port will invest 40 billion Yuan to extend Tianjin port area to 100 sq km from present's 30 sq km and will construct about 30 projects. The 2 biggest projects in Tianjin port's history— the 300.000 DWT crude oil terminal and north port's container terminal 3rd section project— have came into operation in Dongjiang port. Singapore port authority and Tianjin port group exploit the north port container terminal 3rd section project corporately. These two parties invest 6.6 billion Yuan jointly to construct and operate 6 deep-water berths. This 6 100.000 DWT container berths' design annual throughput will reach 400 TEU. It is predicted that to the year of 2010, Tianjin port's container throughput will increase to 10 million TEU. According to the plan, the first 3 berths will put into operation in 2008.

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2.2 Competition situation of Tianjin port and circumjacent ports

With the economic focus's transfer to Asia-pacific region, there has already formed container transportation centred port chain comprising Pusan to the north and Singapore to the south which has formed a ring of encirclement to costal ports of china. At present, china's northern ports' major international container pivot port competitors are Pusan and Guangyang in Korean and Kobe port in Japan.

2.2.1 Major competitors aboard

2.2.2.1 Pusan port

Pusan port is located in the southeast of Korean and is the most important pivot port in Korean. Pushan port is initiated in 1876. Now it has already transported 80% of container cargoes of Korean and become the transit base from Asia continent to North America. Pusan port has been the 3rd largest container port one time, but now it has been over passed by Shanghai port and Shenzhen port and dropped to the 5th largest container port. In the year of 2005, Pusan port has completed container throughput 11.84 million TEU. Pusan port is a very big competitor of Tianjin port. It container throughput and port condition is still much bigger and better than Tianjin port and either port in the north of china though its world status dropped recently.

Figure 2-1 shows the comparison of container throughput in 2005 between world's major container port including Pusan port and china's northern port. Table 2-2 shows current port condition of Pusan port.

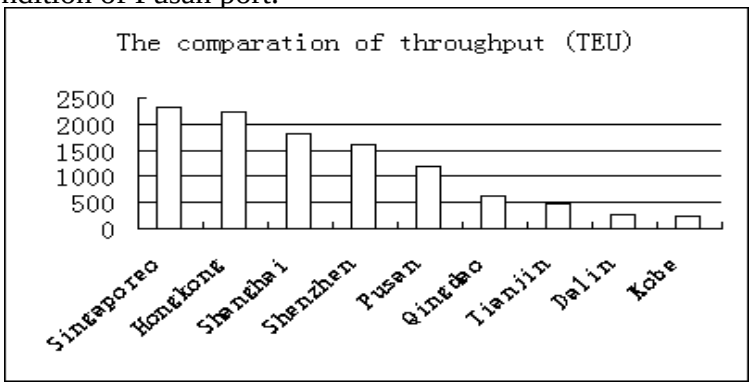


Figure 2-1 The compare of throughput (TEU)

Source: Arrange on my own according to statistic data of customers

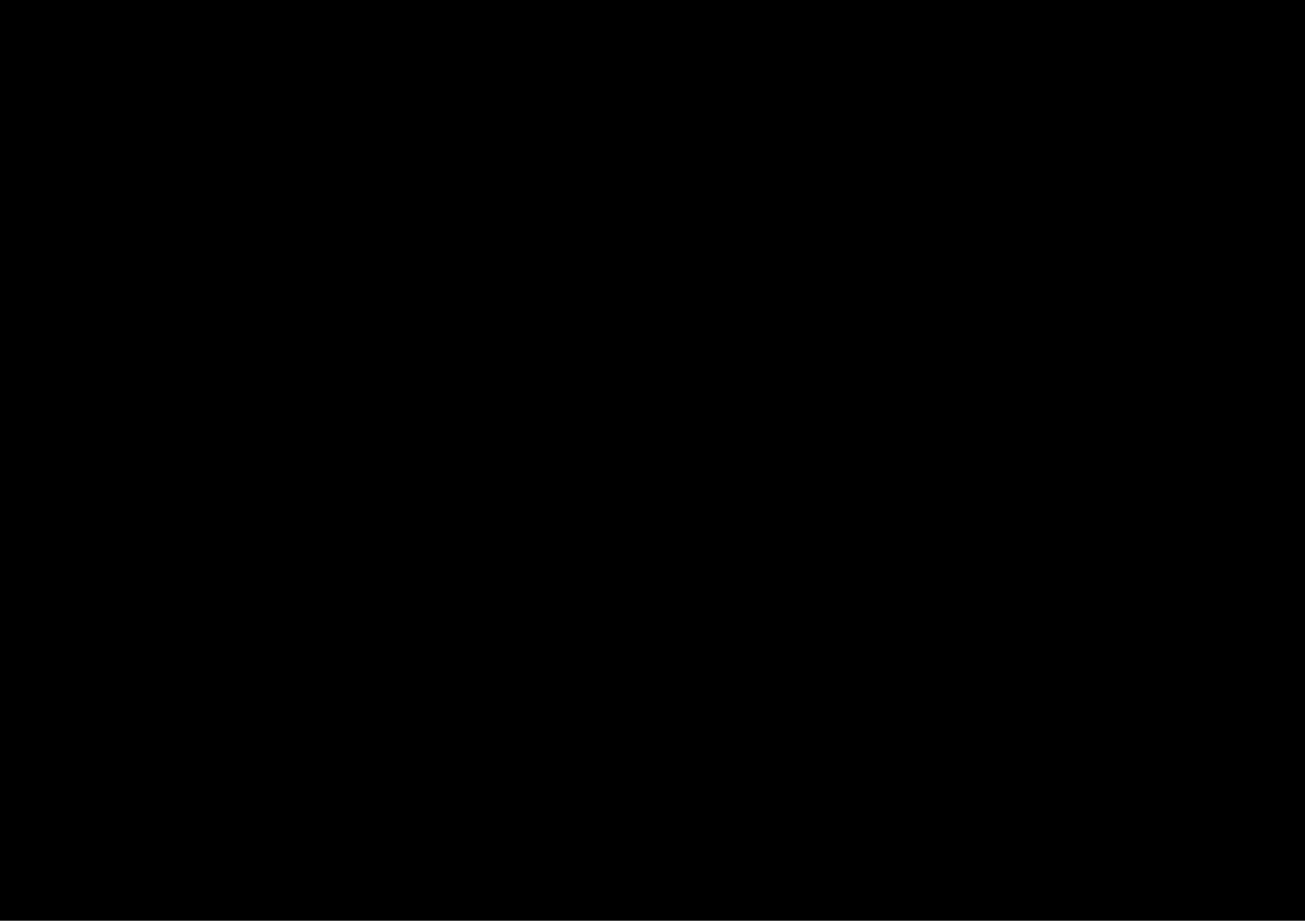
Table 2-2 Current condition of Pusan port.

Category	Total	Pusan new port
Number of berth	25	3
Berthing capability	DWT Number 50.000 20 20.000 1 10.000 1 5.000 3	DWT Number 50.000 3
Handling capability (10 thousands TEU/ year)	616	90
Draft	11-17meters	16

Source: http://chinese.busan.go.kr/business/04_01.htm

2.2.1.2 Guangyang port

Guangyang port is the 2nd largest container port in Korean. In order to enlarge transportation market share in north-east Asia, aside from enlarging Pusan port, Koran also invest a lot to expend Guangyang port for purpose of making it a regional international container transit port and attracting more Chinese export and import container cargoes. At present, Guangyang port has 12 berths and the project plans to build 4 berths more until 2006. Until the year of 2011, there will be 33 berths in number and at that time Guangyang port will become the top number 10 container



2.2.1.3 Kobe port

Kobe port is the most important port in Kansai, Japan. The total vessel into and out of port is 90 thousands and ranks the number 1 in Japan.[7] Since 1968 when the port is initiated, Kobe port became a very important portal of Japan and the one of the world famous port. Kobe port is the second largest port in Japan, the port area is shaped like fan and the total area is about 10 sq km. The yearly throughput is a little behind Yokohama and reached 100 million tons. In the 1950th, Kobe port begins the modern construction of berth. Though the Hanshin-Awaji earthquake makes Kobe port suffer seriously in 1995, people in Kobe work hard to reconstruct the berth. Only in two years, Kobe has completed all of the equipments reconstruction. The number of periodic line and vessels via port has recovered the level before earthquake. Now Kobe has become the biggest trade port in Japan. At present, Kobe port is addressed itself to readjusting port fee and facilitating ships' entering and leaving port formality as well as strengthening information management jobs for the purpose of becoming 21 century's new-type core port.

The ports above have deployed serious competition in developing international container transportation. The competition focus is on contention northeast international container transit transportation market. Among these ports in northeast region, Pusan port has favourable base of container transit. Plus the join in of Guangyang port and the implementation of development planning, it is the foremost competitors of Tianjin port. Kobe port in Japan has huge development potential especially the processing industry's transfer in Japan and huge foreign investments bring large quantities of container sources for Japan. It brings beneficial condition for Kobe port's container development. But because of enormous container lost caused by Hanshin-Awaji earthquake which largely weaken the international competitiveness of Kobe port, it is quite difficult to recover. So Kobe port is the minor important competitor.

[7] http://finance.sina.com.cn/chanjing/b/20060220/22322357716.shtml

The recent situation is that a large number of containers in Bohai rim are transited in Pusan. It greatly affects the process of china's construction of pivot port and makes china's northern costal port including Tianjin port gets into a very disadvantage status in the competition of pivot port. So speeding up the construction of china's northern costal port is very important to improving the status of north ports of china. Table 2-4 shows the competition characteristics among Tianjin port, Pusan port and Kobe port.

Table 2-4 The competition characteristics among Tianjin port, Pusan port and Kobe port

Ports	Container throughput （TEU）	Port infrastructure and development planning	Port policy	Competition relation with Tianjin port
Tianjin port	*480 (2005) 16th largest container port in the world	*Fairway depth: -14.8～-17.2 meters *Design handling capability: 355 TEU *North port container terminal project: until 2010, 16 modern large-scale container berths will be built. New adding container throughput capability will be 9 million TEU. In 2011, annual container throughput capability will be 12 million TEU	*Encourage foreign investment *Trying for free port policy	

Pusan port（Including Guangyang port）	*1184 (Pusan 2005) *The fifth largest container port in the world	*Handling capability is 616 TEU in Pusan port. Guangyang port is 280 TEU *In 2011 the two ports' container throughput capability will reach 24 million TEU *Establishing north-east Asia logistic net and 21 century pacific central port	*Low freight rate & high quality service *Provide allowance, turnover assurance and infrastructure policy	*The competition aim is distributing Japan port's container and scramble containers from north costal port in china *Foremost competitor
Kobe port	*226（2005）	* fairway depth: -15～-16 meters *Establish 21 century Asia father port	*Amend port tariff and simplify formalities	*Minor important competitor

Source: Arrange on my own according to materials

2.2.2 Main domestic competitors

In the north of china, the main container ports are Dalian port, Tianjin port, Qingdao port, Yingkou port, Yantai port, Jinzhou port, Dandong port and Longkou port. Among these, only Dalian port, Tianjin port and Qingdao port stand a chance to become north container pivot port. Table 2-5 shows the 3 ports' container throughput and growth rate in recent 5 years.

Tabel 2-5 The container throughput of Qingdao port, Tianjin port and Dalian port from 2001 to 2005

Tabulation unit: 10 thousands TEU

Year	2001	2002	2003	2004	2005
Qingdao	264	341	424	514	630
Tianjin	201	241	301	381	480
Dalian	122	135	167	221	265
Qingdao		29.17%	24.34%	21.23%	22.57%
Tianjin		19.90%	24.90%	26.58%	25.98%
Dalian		10.66%	23.70%	32.34%	19.91%

Source: Arrange on my own according to materials of customers

2.2.2.1 Qingdao port

In 1997, port's container throughput over passed Tianjin port and became the largest container port in the north of china. In 2003, Qingdao port has completed container throughput 4.239 million TEU and listed 3rd in china's top 10 container ports. In the year of 2003, Qingdao port announced that in the following 7 year, Qingdao port will invest 16 billion Yuan to build port for the purpose of breaking through 200 million tons in throughput in 2010 and reaching 10 million TEU in container throughput. Compared with Tianjin port and Dalian port, Qingdao port owns comparable favourable natural condition. Tianjin port is located in the deep level of Bohai rim. Dalian port is located in the mouth of Bohai rim. But Qingdao port is facing wide yellow sea and has the advantage of nearest to the world major route. Qingdao port still has deep-water advantage that can better satisfy the calling need of 6^{th} generation or even bigger container ships. The container terminal 3rd phase project in Qingdao port has the most advanced container terminal which can directly berth super container ships with 20000 TEU. Besides, the terminal furnish the most advanced container loading and discharging equipment and adopt modern management method and information system hence the efficient is very high. But

compared with Tianjin port and Dalian port, Qingdao port also has its disadvantage. The hinterland is narrow and 90% of containers are coming from inner province. Localization phenomenon is very conspicuous. Also it is too close to shanghai, and shanghai is establishing yangshan port now which will greatly effect Qingdao port. Besides, Qingdao port's dominant business is overly single and port's loading and discharging income accounts for 80% of the overall income. Asides from that, Qingdao port's storage ability is low, which is even less than half of Dalian port. Storage capability is one of the important attributions of measuring a port's logistic industry's development. In recent years, in order to break limit, Qingdao port announced the strategy of "9.6 million sq km are all Qingdao port's hinterland" and established office in the whole nation to attract cargoes.

2.2.2.2 Dalian port

Dalian port is located in the south of liaotung peninsula which east is Yellow sea, west is Bohai, south is Shandong peninsula separated by Bohai strait. Dalian port is not only the trade centre of liaoning province, but also a very important international gateway of northeast china and inner Mongolia. Since the building of the port, Dalian port has already formed stable system of passenger& cargoes flow and owned 73 specialized berths for container, crude oil, product oil, coal, grain, fertilizers and mine. Dalian port is a good modern all-around port with favourable collecting and distributing condition and service function. Besides, through Siberia railway Dalian port became the origin point of land bridge from Asia to Europe. In recent years, Dalian port's container throughput kept growing. But due to the economic depression of northeast china, low containerisation rate and the transfer of container port from previous one to Dayaowan port, Dalian port's container throughput's growth is competitively slow. It only completed 2.65 million TEU in 2005. Table 2-6 shows the comparison among Tianjin port, Qingdao port and Dalian port.

Table 2-6 The comparison among Tianjin port, Qingdao port and Dalian port.

Port	Container throughput （10 thousands TEU）	Port infrastructure and development planning	Port policy	Comparable advantage
Tianjin port	480（2005） 16th largest container port in the world In recent 4 years, the annual growth rate is about 24%	*Fairway depth: -14.8～-17.2 meters *There are 15 container berths now. The number of container berths under construction is 6 and the new-adding capability will be 4 million TEU *Construct container logistic center	Rely on economic hinterland and construct china's north container pivot port	*hinterland advantage *More ocean Shipping containers *Developed collecting and distributing system
Qingdao port	630（2005） 13th largest container port in the world In recent 4 years, the annual growth rate is about 24%	*The 3-phase terminal's coastline will be about 2400 meters in length and 17 meters in depth that can call 10.000 TEU containers. The 4th terminal's coastline will be about 2000 meters in length that can build 4-5 berths.	*Foreign trade container terminal moves to Qianwan port *The 3rd and 4th phase of Qianwan port attract investment at the same time *Joint operate	*Good foundation of international container transportation *More flexible operating strategy *The main competitors

		The total investment will be about 5 billion.	with world-famous shipping companies and Container terminal	for Tianjin port
Dalian port	265 （2005） 30th largest container port in the world In recent 4 years, the annual growth rate is about 21.7%	*Recently there are 4 container berths.	*Cooperate with Singapore port authority, DCT and china shipping Group * Bring in new management philosophy and management mode	*Region advantage *Joint venture Experience in operating container terminal *Good natural condition *Secondary competitor

Source: Arrange on my own according to materials

Chapter conclusion

From the above analysis, we know clearly Tianjin port's own current situation, its competitive status, major competitors and their situations. It provides foundation for future analysis. Because of port economy scale and port economy's stimulating role on economy, every costal city invests largely in port construction which cause obstacle on Tianjin port's development. Under this situation, what Tianjin port should do? In the following chapters, I will give my answer.

Chapter 3 Necessity of china's establishing northern container pivot port

3.1 The press for establishing china's northern container pivot port

3.1.1 Demand of Bohai rim's economic development

From south to north development process of Chinese eastern costal economy makes Bohai rim becomes a new round economy growth pole. Following up Pearl River data and Yangtze River data, Bohai rim will become one of the most active regions in china in the beginning of new country. Bohai rim is a place where economy and culture develops and natural resource and industry base abounds. It is not only a most powerful region in national comprehensive scientific power, but also an important national industry base of resource and raw materials. At the same time, it is also the region with high open degree and good developed outward type economy.

The economic development of provinces and municipalities in Bohai rim mainly rely on or in search of port or costal cities to support. Ports and costal cities have formed one after another economy sectors which promoting the development of regional economy. Therefore, the development of costal cities is of great importance to the economic development of Bohai rim.

At present there are 3 major container ports in Bohai rim, they are Dalian port, Tianjin port, and Qingdao port. The direct hinterland of these 3 regions associated to Heilongjian, Jilin, Lliaoning, Hebei, Beijing, Tianjin and Shandong provinces. Its

hinterland's container production demands an international container pivot port in the north of china. Once an international container pivot port like this has formed, the increase of international transit container will realized. Circulating like this, it makes the development of Bohai rim's container port can keep up with the requirement of the time. So the construction of the northern container pivot port is the economic and social development's objective demand of Bohai rim.

3.1.2 Construction uniqueness of china's northern container pivot port

At present, all the Tianjin port, Qingdao port and Dalian port aims high and propose to establish china's northern container pivot port. But from the development history of world container pivot port, within the same Bohai rim region, 3 ports cannot become international container pivots at the same time. That's because container transportation exist timeliness and depressiveness that makes liner transportation exist "Matthew effect". Matthew effect refers to a phenomenon that good is going to be better, bad is going to be worse, many are going to be more and few are going to be less.[8] That is the existing port that has already established lots of routine line will attract more containers because of its wide line coverage, density and transportation timeliness. More containers will lead to port's cohesion force. So in one region that is in the Bohai rim port cluster, there is going to be only one international container pivot port. Of course, tripartite confrontation of 3 ports will exist for a while, but with the 3 port's own development in the future, there is sure going to form an international container pivot port that is most powerful in synthesis strength and most potential. The other 2 ports will become the feeder port servicing for this pivot port in this region.

As a northern all-around international port, national major pivot port, Tianjin port's role in stimulating port hinterland's development is becoming larger and larger with

[8] http://info.research.hc360.com/2005/04/2208222939.shtml

china’s reform and opening process. Tianjin port’s development should be in accordance with the economic development of its dependant cities and port hinterland. Bohai rim especially the region of Beijing and Tianjin where is Tianjin port in is the economic development focus of china’s northern region. Tianjin port’s wide hinterland has huge development potential. According to country’s positioning on Tianjin, Tianjin port is going to be constructed a modern port city and an important economic center of china”. Port is a very important advantage for Tianjin. Port city is an important feature of Tianjin. On the basis of ample research and advantage analysis, full employing port economy and port city & sea economy’s huge radiation role, adjusting port’s function and cargoes structure, exerting port’s comprehensive transportation pivot role, improving port industry’s benefit, optimizing port’s service quality, strengthening port’s cock status, exerting the win-win condition of city development and port development, it might be possible that Tianjin port be constructed the only container pivot port in the north of china.

But at the same time, century committee of china brings forward that establishing Dalian port to be the northeast international shipping center. Whether it is contrary to the strategy of Tianjin port or not? The answer is definite not. In fact, almost all of the big ports in the world are very close to another big port. For example, Los Angeles port and long beach port, New York port and New Jersey port in America, Japan’s Osaka port and Kobe port, German’s Bremen port and Hamburger port and so on. The real condition shows that establishing Dalian port to be the northeast Asia international shipping center is not contrary to Tianjin port’s development.

3.2 The necessity of establishing china’s northern container pivot port

3.2.1 Need for improving china's international economy competitiveness and northern port's international competitive status

Port's construction and development is not only due to the need for social and economic development, but also driven by the city the port is in and the development of port's hinterland. In turn, port's development has huge counter reaction on port hinterland's economy. Port's development can stimulate hinterland's economic development. So container pivot port is an important section in international economy, international trade and international shipping.

At present, there have already been many world famous container ports like Hong Kong, Singapore, Gaoxiong, Kobe, Pusan, Tokyo and Yokohama in Asia. A very big proportion of containers from northern part of china are transshipped in this region, which largely increase transshipment link and transshipment fee hence losing large amount of non-trade foreign exchange and weakening product competitiveness internationally. If china's 3 northern big container ports are able to correctly position themselves according to practical situation and their own development condition, it is not only beneficial to exerting costal port's resource's efficiency and rewards, making full use of port's own advantage, taking part in international port competition, improving china ports' international competitive power, but also getting over port's excessive unordered competition and promoting the forming of northern port's multi-level container transportation network—international container pivot port, feeder transportation and domestic transportation.

3.2.2 Strategic need for realizing national development

Chinese communist party 16th conference report indicates that china's development is going to follow a new industrialization approach. It is a modern approach

complied with the situation of china and world economic development trend. Choosing an approach like this has significant meaning for china's realizing the goal of overall construction of well-to-do society. Realizing new industrialization, we must comply with Chinese situation and choose new industrialization approach that focus on firstly developing manufacturing industry. That's because china is in the middle of industrialization, capacity development is unbalanced, so in the following years, traditional industry especially the manufacturing industry still have wide market demand. It is reported that manufacturing industry directly creates one thirds of GDP. It takes account four fifths of the whole industry, provides more than one thirds' financial income for china that occupies 90% of export and arranges occupation of more than 80 million persons. Put another way, at today when the high-tech industry developed quickly, our country's traditional industry takes a very big proportion at the whole national economy and still the main power in the economic development. Manufacturing industry especially equipment manufacture industry is still the driven engine of the country's industrialization and modernization. Not owing own powerful manufacture industry, not equipping and changing the whole industry and improving production technology level, it is impossible to realize industrialization and modernization. At the same time, china is a big country with nearly 1.3 billion populations and plenty of labor resource. So the employment pressure is very serious. At the process of industrialization, especially at the process of new industrialization of the connection of industrialization and informationization, this contradiction even will deteriorate. So at the beginning of realizing new industrialization, developing and absorbing manufacturing industry is very suitable to exerting china's labor advantage, reducing china's occupation pressure.

Northeast china is an important heavy industry base with abundant traditional manufacturing technology and labor force advantage. Since china's reform and opening, in the process of adjusting traditional industry structure, reforming manufacture technology and upgrading products, northeast's traditional heavy industry has experienced the suffering of reform. CPC (communist party of china)'s

strategic decision on china's new manufacture industry road create new development chance for stimulating north-east economy and restoring northeast industry base based on manufacture industry. As the sea gate of northeast manufacture industry base, northern container pivot port's construction has more urgent demand.

3.2.3 Need for promoting north region's social and economic development and opening

Bohai rim region is located in the connection parts of south to north transit and east to west transit. Its hinterland is the important window access to northeast Asia and the world. Because of the fact of Geo-economy, the economic hinterland of ports in Bohai rim has strong complementation with some regions and countries in east-north Asia in natural resource and economic resource. Table 3-1 shows national resources' complementation between regions in northeast Asia including china.

Table 3-1 The complementation between regions & countries in northeast Asia in natural resource and economic resource aspect[9]

		China	Russia	North Korea	South Korea	Japan
Capital		-44.6	-50.3	-42.11	-13.0	+57.7
Natural resource	Mine	+42.3	+35.9	+28.6	*	-41.4
	Agriculture	+35.5	-13	+17.6	-38.4	-10.8
	Energy sources	+34.6	+73.3	*	*	-76.4
	Forestry	+13	+50.8	+10.3	-84	-24.9
	Marine product	*	+22.2	+44.1	-15.8	-13

[9] provided by professor Zong beihua

Labor force	+44.9	-26.1	+32.7	-21.3	-22.9
Operation management	-28.4	-26.1	-21.1	*	+37.8
Technology	-63.4	-55.8	-56.1	+27.7	+74.6
Productive materials	-23.8	-22.9	-23.8	-14.9	+15.8
Consumption goods	-14.6	-19.2	-13.7	+33.6	+15.8

Annotate： + Potential supply –Potential demand *almost balanced

Source: provide by professor Zong beihua

From the table we know that china has advantage in natural resource's supply, hence having strong complementation with Japan and Korean. At agriculture aspect, china has comparative big complementation with Russia. In the aspect of operation management, technology, productive materials and consumption goods, china is in the minority position hence having comparative good complementation with Japan. This kind of objective existing complementation stimulates economic cooperation between countries and it also has some reference to Bohai rim's international economic cooperation.

Bohai rim with the center of Beijing and Tianjin are close to Japan and Korean who are the most developed countries in northeast Asia. The location advantage plus the natural resource and economic resource's complementation make these 2 regions will cooperate closely. So with the increasing deepening of international industry transfer, there will be large quantities of capital and technique intensive industries transferring to Bohai rim. So in the following years, capital-intensive industries in Bohai rim will get ample development. With the economic rising in south of china, how to develop northern economy, how to change economic development's unbalanced phenomena will become a realistic problem for china's stable and gradual development in economy. China's economic growth focus's from south to north gradient transfer is a necessary trend for china's transform and opening and economy development. Cities in Bohai rim usually have comparable good infrastructure and industry or technique condition as well as high capability of

comprehensive technology and employees. At the same time, Bohai rim is one of the densest economic regions among urban agglomeration, industry clusters and port clusters in my country or even in the world. In consequence, speeding up the construction of north container pivot port is the need for promoting economic and social development of southern region of china.

3.2.4 Requirement for china port industry's configuration

From the point of the world economic development trend, the world's economic growth focus has transferred to Asia-pacific region. Within the region of Asia-pacific, northeast Asia is becoming more and more worldly famous by right of its favorable location, abundant resource condition, multi-level economic structure and huge development potential. In recent years, the economic cooperation between regions in northeast Asia is increasingly actively. Bohai rim region is located in the center of northeast Asia, and it takes a very important role in international diversion of labor so it has the potential advantage of becoming northeast Asia's economy center. Since 1980s, some comparable developed countries like Japan and Korean in this region has carried through industry restructure. This kind of restructure brings lots of opportunities to Bohai rim regions. Objectively, it requires speeding up north container pivot port's constructer to promote china's taking part in the process of economic development in northeast Asia.

Chapter 4 Qualification analysis of establishing Tianjin port as an international container pivot port

4.1 Strengths analysis of Tianjin port around northeast Asia and Bohai rim

4.1.1 Tianjin port is an all-around international trade port, major container port and energy port in north china

Tianjin port is located in the connection point of Beijing & Tianjin and Bohai rime economy circle cluster and it is the nearest port in Bohai rim port cluster to north china and northwest china. This makes Tianjin port owns wide economic hinterland. Besides, Tianjin port is convenient to every port in the north of china and northeast Asia as well as ports in Pacific region. It takes a very important status in international and internal trade.

4.1.2 Tianjin port has been paid great attention by government at all times

Tianjin port is an important guarantee of Tianjin’s economy and social developm

government. Tianjin port has become the window and channel of going to world since Tianjin's reform and opening up. Bonded area of Tianjin port that is established in 1991 has poured vigor in attracting foreign investment and in strengthening function sides. As the advance area of reform and opening, Tianjin port has already become the accumulation area for attracting foreign and domestic capital. It has realized 5 billion US dollars of accumulated agreement foreign investment and 2 billion US dollars of actual amount of foreign funds utilized. Until recently, there have been more than 4000 enterprises initiated by 97 countries and regions, 27 provinces, municipalities and district and 47 big companies set up a home in bonded area of Tianjin port. Among these there are 33 companies that are in the world's top 500 ranking.[10] At present, Tianjin binhai new district with the kernel of one port (Tianjin port) and 2 zones (economic technological development zone, bonded area) has been the most economic growth point in Tianjin. Until the year of 2005, Tianjin binhai new district has realized GDP of 160.86 billion Yuan that accounted for 43.9% of that of Tianjin[11]. In the year of 2005, Tianjin binhai new district's gross industrial output value and the industry value added over passed shanghai pudong new district. Overall export volume has increased to 18.47 billion US dollars in 2005 from 0.5 billion US dollars in 1993 and it occupies 65% of Tianjin port. Omnibearing opening up pattern has almost formed. Tianjin binhai new district's development greatly stimulates Tianjin port's development just like shanghai pudong new district's stimulation on shanghai port. Looking at the future, Tianjin port will go to the world more openly. At the aspect of making use of international resource, capital and taking part in international competition, Tianjin port which acts as an import and export gateway will take more and more important role.

[10] http://gov.finance.sina.com.cn/zsyz/2006-03-23/82045.html
[11] http://www.economicdaily.com.cn/no1/newsmore/200604/13/t20060413_117124.shtml

4.1.3 Tianjin port owns favorable port condition

Port condition owned by Tianjin port is an important foundation of developing regional association, is the pre-condition of Tianjin port becoming economy center and transportation pivot connecting north-west, north china and north-east Asia. Since china's reform and opening, Beijing needs a convenient foreign gate. In Bohai rim, Tianjin is the best choice. But the cooperation between these two cities once got into deadlock. Beijing cooperated with Tangshan and established Jingtang port in 1993. But Jingtang port began its first step too late and it is distant to Beijing. So it can't solve the problem of Beijing. It is quite likely that Tianjin port take more roles in the cooperation of Beijing and Tianjin.

At present, Tianjin port has already stepped into the range of world's top 10. It has business contract with more than 300 ports in more than 160 countries and regions and established friendly relations with 10 ports. In Tianjin port, the majority of containers are coming from Beijing, Hebei, Shanxi, Shanxi, Ningxia, Gansu, Qinghai and Xinjiang. Even Chongqing in the Yangtze valley views Tianjin as gateway of exporting to Japan and Korean.

4.1.4 Construction of infrastructure developed quickly in Tianjin port

In 2005, Tianjin port completed infrastructure investment 4.9 billion Yuan and listed in the front line among national ports. This year, Tianjin port will go on enlarging infrastructure investment according to the demand of establishing Tianjin to be a first-class port in the world. It is estimated that the infrastructure investment will reach to 7 billion Yuan this year[12]. This year is the first year of 11th five-year plan. Tianjin port will further accelerate construction and multiple major projects will

[12] http://www.bh.gov.cn/news/2006-02/08/content_6190966.htm

complete. Among these, container terminal section A in north port of Tianjin is going to be 1100 meters and can berth 100.000 DWT ships and design annual throughput capability is 1.7 million TEU. Nanjiang 12 # break bulk cargoes berth is 200 thousands berth and the design annual throughput capability is 10 million tons. It will be completed at the end of September. 150.000 DWT coal terminal will be completed in December. The design annual throughput capability is 35 million tons. Besides that, In order to speed up port construction, this year, some other major projects like north port container terminal section B project, 3rd phase of container terminal in north port and 300.000 DWT oil terminal will come into operation. During the 11th five-year plan, for the purpose of building into modern international deep-water port, Tianjin port will invest 36.7 billion Yuan to construct port so as to further enlarge scale, improve class, perfect function and improve Tianjin port's core competitive power.

4.2 The weakness analysis of Tianjin port around northeast Asia and Bohai rim

4.2.1 Circumjacent port's large scale and specialization tendency is increasingly apparent

For adjusting to the developing trend of international shipping, all of the major ports in Bohai rim are accelerating construction of bigger and special ports. 300.000 DWT oil terminal and 300.000 DWT mine terminal, which totally cost nearly 2.1 billion Yuan in Dalian, put in operation at September of 2004. In Qingdao port, container develops every quickly in recent year. The depth of water reached -17.5 meters and it has already possessed the condition of direct calling for containers above 10000 TEU.

4.2.2 Transportation network needs further construction

The construction of transportation network is very important to port's development. But because of lacking special railway transit equipments at present, the terminal capability from port area to railway is very limited. Asides from that, the problems of railway itself and equipments deficiency lead to that railway container transportation's advantage cannot exert. Undeveloped and unsystematic multimodal transportation to the great extent constrain Tianjin port logistic industry's development. So according to the characteristics of locating in the west of Bohai rim where is close to north china, vast hinterland of north-east of china, Tianjin port should on the one hand strengthen the access construction of highway especially speeding up the research on express highway direct into the port if the transportation range is within 500km, on the other hand should accelerate the access construction between port and railway of hinterland if the transportation range exceed 500km.

4.2.3 The berth needs further construction

Presently, national and world container transportation volume increases very quickly. Taking Tianjin port as an example, in recent 5 years, the growth rate of Tianjin port's container throughput is about 23.4%. With the quick growth of Beijing and Tianjin, china's entering into WTO and the implementation of western development strategy; container throughput has achieved radical progress. At the same time, driven by economic of scale, all the major shipping companies in the world are building or ordering ships larger than 5000 TEU. Post-panamax ships are becoming the most popular type of ships in Asia-Europe and Asia-West America route. Large ships increase more quickly than small ships. Table 4-1 shows the ship ordering condition in recent years and Table 4-2 shows the evolution of the ship's size. From the Table, we can see that container ships are becoming bigger and bigger and container ships

like 5th and 6th generation or above are becoming more popular. Ships' DWT has reached 50.000 DWT—60.000 DWT above, the draft reaches 13—15 meters. 8000 TEU container ship is no longer rare any more. 120.000 TEU container ship is under construction. But at the present time, there are only 15 container special berths in Tianjin port; the annual throughput capability only has 4 million TEU. Considering the gradual growth of container throughput and the longer cycle time of container terminal construction, throughput capability deficiency will exist for a long time in Tianjin port.

Table 4-1 World container ship fleet (until April 1st, 2005)

Ship number TEU	Now	Book in 2005	Book in 2006	Book in 2007	Book in 2008	Book in 2009	Total
000-499	411	0	0	0	0	0	0
500-999	619	76	67	10	2	0	155
1000-1999	938	52	54	55	15	0	176
2000-2999	548	45	60	42	10	2	159
3000-3999	278	6	17	34	7	0	64
4000-4999	254	29	39	53	28	1	150
5000-5999	190	32	22	24	12	0	90
Above 6000	138	38	77	74	53	4	246
TOTAL	3376	278	336	292	127	7	1040

Source: International Containerization (2005), *Key figures of supply and demand in container shipping*, 6, 2-3

Table 4-2 Evolution of the ship's size

Tabulation unit: meter

TEU	LOA	Width	Draught
1500	225	24.5	9
3000	275	27.5	10
4500	300	32.2	11.5
6600	320	40.0	14.3
8000	347	42.6(17 row)	14.5
12000	380-400	22 row	15.5
15000-18000	Above 400	24 row	18

Source: Arrange on my own according to materials

4.2.4 Unsoundness of port logistic operation management mode

Presently, Tianjin port's area is lack of large-scale operators with strong organizing and coordinating capability. Aside from COSCO, Sinotrans and CMST (China National Materials Storage and Transportation Corporation) have developed modern logistic operation, most of warehousing enterprises' scale is small and the function is single. They are in the scattered arrangement and dispersed condition and lacking the function of systematic logistic service. This largely hinder the seamless services.

4.2.5 Unsoundness of information management

Presently, Tianjian port hasn't established wide information service system. Though port EDI has been established, it still has distance with social requirement for developing shipping transaction, goods transaction, information distribution, financial accounting, data transfer and file transfer. Information resource hasn't been

utilized effectively. The whole Tianjin port's information service system construction needs future improvement under uniform layout.

4.2.6: It is faster to world major route compared with Dalian port and Qingdao port

Firstly, Tianjin port is in the inner of Bohai rim. It is faster to international major route (Far East-Europe, Far East North America) compared with Qingdao port and Dalian port. Ships going into and out of Tianjin port need to pass through nearby waters of Dalian port and Qingdao port. If Tianjin port is a regional pivot port, the collecting direction will just opposite to the shipping direction. So the overall transportation cost will be high. In attracting transit cargoes aspect, because Tianjin port is farther to foreign ports, the attracting power will be lower than Qingdao port and Dalian port. Table 4-3 shows the distance from Tianjin port, Qingdao port and Dalian port to major ports in Europe and America.

Table 4-3 Distance between Tianjin port, Qingdao port, Dalian port and major ports in Europe and America.

Tabulation unit: sea mile

Ports	Long beach	Los Angeles	Hamburger	Rotterdam
Dlianlian	6423	6405	11162	10914
Qingdao	6379	6361	11009	10761
Tianjin	6566	6548	11304	11056
Distance To Dalian	143	143	142	142
Distance To Qingdao	187	187	295	295

Source: Liu yonghong. (2003). *Site selection of international shipping center in the north of china.* Unpublished master's research paper, Dalian Maritime University, Dalian, China

Chapter 5 Forecasting of Tianjin port's container throughput

5.1 Methodology of forecasting Tianjin port's throughput

5.1.1 Methodology

Basing on the geography location of Tianjin port and Bohai rim's circumjacent ports and current container transportation market's pattern, the region of influence include provinces and municipalities like Tianjin, Beijing, Shanxi, Hebei, Inner Mongolia, Shanxi, Gansu, Qinghai, Ningxia and Xinjiang. Among these, Beijing, Tianjin, Hebei, Shanxi is the direct economic hinterland of Tianjin port. The ports existing most serious competition with Tianjin port are Qingdao port and Dalian port. In this region, there has already formed Europe-America rote centered international ocean lane, Asia region centered near ocean lane and port container transportation system that take costal feeder line as auxiliary. Because of Tianjin is located in Bohai rim that is a very economically developed region with high level of opening up to the outside world and high degree of foreign trade economy, it is unnecessary to worry about container cargoes for foreign trade. At present, Tianjin port's container throughput lists number five of china just behind of Shanghai, Shenzhen, Qingdao and Ningbo. Presently, Tianjin port's collecting and distributing network mostly rely on roadway and railway. With the collecting and distributing network's gradual perfection, Tianjin port's economic hinterland is extending toward vast areas of the west. In order to forecast the developing trend of Tianjin port's container throughput, we should begin with analyzing trend of contribution region's domestic and foreign trade's cargo transportation.

The specific methodology for forecasting Tianjin port's container throughput is as follows

5.1.1.1 Forecast the development level of import and export in contribution region for the next few years according to economic and social development planning and trend within hinterland together with the developing trend of outward-oriented economy.

5.1.1.2 According to the structure of main foreign trade cargoes, analyzing the proportion suitable for container, that is foreign trade cargoes' suitable for container rate. This rate is affected by foreign trade cargoes' structure and increase with the increase of container transportation level and the optimization and upgrading of foreign trade cargoes' structure. In particular, in order to adapt to world economy's change and china's entering into WTO, industrial structure and product structure are sure to optimize and upgrade more. Therefore, foreign trade's suitable-for-container rate is going to increase gradually.

5.1.1.3 Basing on analyzing cargoes structure, identify how many containers can be produced by 100 million US Dollars' foreign trade volume. There are 2 aspects of effect influencing container production of 100 million US Dollars' foreign trade volume. Negative aspects is that with the increase of high value-added foreign trade product, container production will undoubtedly decrease, positive aspect is that with the increase of container transportation level, low value product also can be transported by container which lead to the container production's increase.

5.1.1.4 Restricted by transportation price and container developing level, all the suitable-for-container cargoes are not transported by container. Containerization rate reflects the proportion of cargoes of true application to containers to all the suitable-for-container cargoes. Obviously, there exist close relationship between containerization rate and container transportation's development level. The container development level of Tianjin port's direct economic hinterland is relatively high; as a

consequence, the containerization rate is relative high. At the same time, the containerization rate of Tianjin port's indirect economic hinterland is relatively low because of bad transportation condition and low level of container development in this region.

5.1.1.5 Forecast every economic hinterland's foreign trade container production in the next few years basing on economic hinterland's foreign trade's import and export developing level, foreign trade cargoes' suitable-for-container rate, container production by one million US Dollars and containerization rate.

5.1.1.6 Forecasting the number of internal trade containers. It should mainly rely on analyzing Tianjin port's previous years' container throughput of internal trade and international trade.

5.1.1.7: International trade container production plus internal trade container production, we can get Tianjin port's overall container throughput. Then According to the distribution index, we can get the real container production.

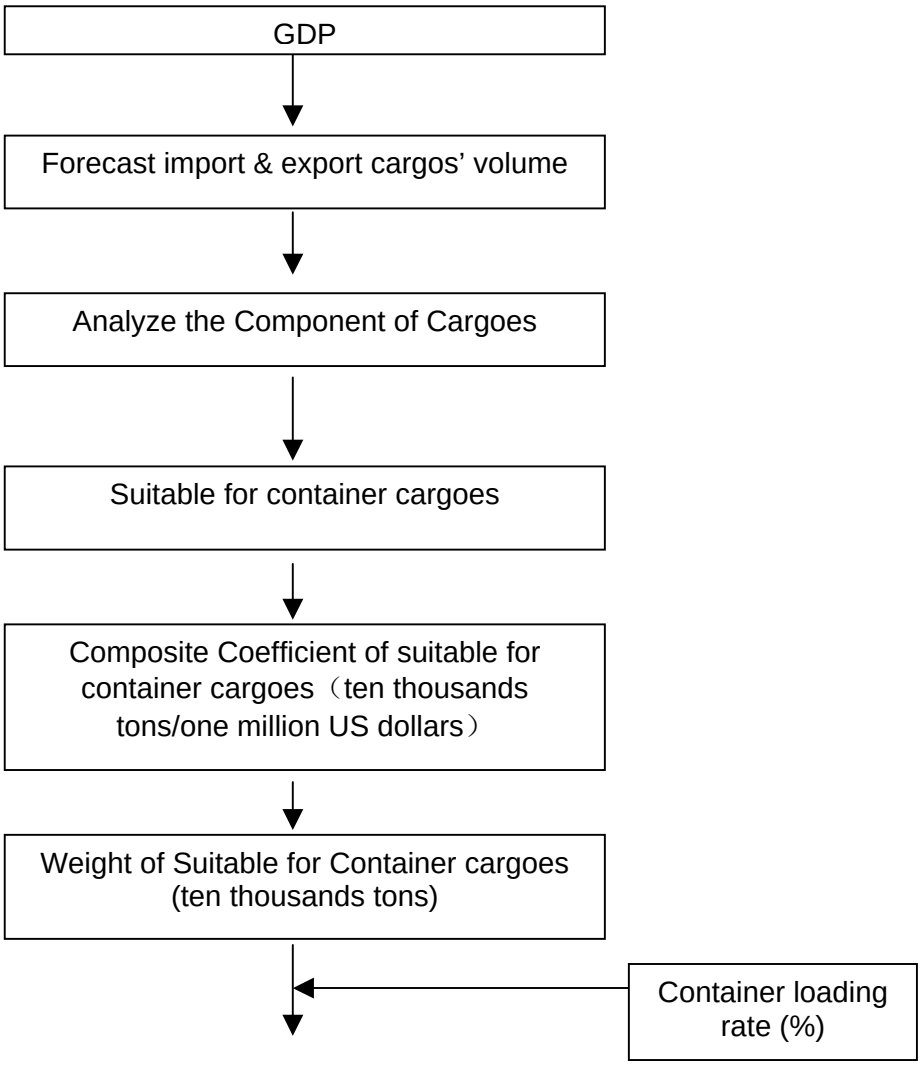
Steps of forecasting Tianjin port's container throughput:

Step 1: According to country's economic and society development planning and every area's "tenth-five year" plan as well as developing trend of import and export, forecast every area's import and export volume; Basing on every area's foreign trade cargoes' structure and development trend, forecast the proportion of suitable-for-container cargoes. According to every area's foreign trade cargoes' structure and price, identify respective container production every one million US Dollars' foreign trade. According to container's developing level and trend, identify every area's containerization rate; accordingly forecast every area's foreign trade's container production in the next few years.

Step 2: According to Tianjin port's internal container development, country's "tenth-five plan" and internal container transportation's planning and assumption, forecast Tianjin port's internal trade container throughput.

Step 3: International trade container throughput and internal trade container throughput form future Tianjin port's overall container's throughput together. Then according to the distribution index, figure out the container throughput by ships.

5.1.2 Flow chart of forecasting



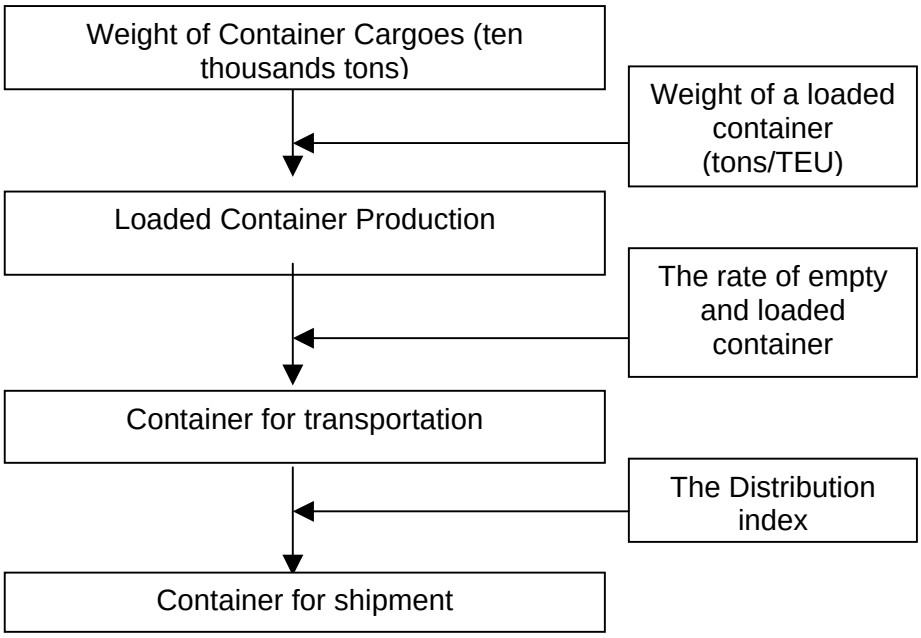


Figure 5-1 The flow of container port throughput's forecasting

5.2 Motivation of Tianjin port container transportation's development

5.2.1 Developing tend of china port's container production

5.2.1.1 Global industries transform provide huge number of container source for Container ports in china

Global industries transform refer to industries transform which occur in the range of the world, that is, the phenomena of some industry transfer from one country or one region to another country or another region. It is realized by capital's international flow.

From the common practice of global industries transform, under usual condition, the process of global industries transform is as Figure 5-2. It begins with labor-intensive industry. Then labor-intensive industry transform to capital-intensive industry. At

last, industry realized the transformation to technology-intensive industry. The process of global industries transform is transforming from developed country to circumlittoral relatively developed region of developing country. Then transform from circumlittoral relatively developed region of developing country to inland-undeveloped area of developing country. Therefore, global industries transform is quite important. For developed country, it is a measure of adjusting industry structure and realizing global strategy. For developing country, it is a route of economy reform, industry structure adjustment, and industry upgrading and technology advancement.

Figure 5-2 The process of global industries transform

Under the wave of global industries transform since 1990s, western developed countries and newly industrial countries' global industries transform has taken on some new trend. The specific behavior is as follows.

ⅰ The enlarging scale of global industries transforms

After entering into the new country, on one side, in order to earn global competition advantage, developed countries further accelerate industry's international transform. On the other side, in order to make full use of the opportunities of international industry transform and speed up domestic industry's upgrading and realize catching up & over strategy, lagged countries also accelerate industry's international transform.

ⅱ Higher-level structure of global industries transforms

Since 1990s, western developed countries had stepped into knowledge economy age. The development of knowledge-based economy not only speeds up industry structure's knowledgization for developed countries, but also makes global industry transform taken on higher quality trend. The shift of key points of global industry

transform begins from raw materials to process industry, from primary product to high value-added industry, from traditional industry to newly industry, manufacture industry and service industry. High-tech industry, financial and insurance industry, electronic information industry, and real estate industry has become an important domain of global industries transform. The process of global industries transform indicates that during 1950s global industries transform is primary product industry focused. After entering into 1990s, the focus of global industries transform shift to service industry and capital & technology intensive industry including finance, insurance, tourism, consulting.

iii Regional internalization of global industries transforms

Regional collectivization of global economy is developing rapidly. It stimulate

5.2.1.2 China’s superiority industry’s contribution to international container shipping

Materials say in the middle and second half of twentieth century, there are 10 industries which china had comparative advantage. They are clothing industry, pencraft articles industry, feather industry, food processing industry, textile industry, furniture industry, metal-manufacturing industry, fabricated rubber product industry, non-metal-mine product and plastic product. These ten superiority-industries are mainly labor-intensive industry. China’s entering into WTO is beneficial for these ten industries. Because entering into WTO make the market between china and WTO members bilateral open, Superiority industry of my country is easier to enter into international market, hence getting comparative advantage.

5.2.1.3 China container production’s developing trend

ⅰ The developing trend of labor-intensive product’s container production

According to analysis above, China’s comparative advantage product labor-intensive product mainly belongs to suitable-for-container product. Especially after the cancel of import restriction of America and EU on my country’s labor-intensive product, china’s container export volume will go on increasing in future.

ⅱ The increasing trend of container export volume for foreign-funded enterprise’s product

With the trend of economic globalization and the advantage of china’s reform and opening policy, china attracts large number of foreign investment by comparative low land price and labor price that make china’s industry layout changed. Costal region of china has become the best place for transferring labor-intensive industry and capital-intensive industry to for developed country and far-flung western areas of china become the place for transferring labor-intensive industry to. These two kinds of industry change lead to 2 type of suitable-for-container cargoes. One type is high value-added suitable-for-container product that produces import and export

containers. The other type is low value-added suitable-for-container product that produces partial import and export containers and mostly internal trade containers. From that, we can see that in the next few years, china's container shipping volume is going to increase.

iii Exploiting western region provide more containers source for ports

Global industries transform speed up the development of economic lagging regions. It is an uncommonly good chance for resourceful western region of china. Eastern costal region and port naturally become the gateway of going out in the area of economy and trade for western region. Therefore, the containers source will be sure to increase.

iv The container growth trend in the north & south part of china

Because of economy developing difference, at present, southern port's container throughput is higher than northern port's. Because these ports had acquired the early chance of container-shipping market, Yangtze rive delta and Pearl River delta's advantage states in container shipping has been unshakeable. But see from another angle, the development space of northern container shipping will be enormous with the rapid economy development of northern region. This predicts that there is still a lot of developing space for north port's container shipping.

5.2.2 Current condition and developing trend of Bohai rim economic region within the state and the feasibility of its being manufacture base

5.2.2.1 Economy states and current condition of the urban agglomeration of Beijing, Tianjin and Hebei & Bohai rim within the state

With the development of economic globalization, 3 big urban agglomerations had shaped in costal region in my country. They are urban agglomeration of Beijing,

Tianjin and Hebei (Beijin, Tianjin, Hebei, Tangshan, Baoding, Langfang, Qinhangdao, Cangzhou and etc) ； Yangtze River delta urban agglomeration （Shanghai, Nanjin, Suzhou, Wuxi, Nantong, Changzhou, Yangzhou, Zhenjing, Taizhou, Hangzhou, Niningbo, Huzhou, Jiangxing, Shaoxin, Zhoushan ）; Pearl River delta urban agglomeration (which include Xianggang, Aomen, Guangzhou, Shenzhen, Zhuhai, Fushan, Jiangmen, Dongwan, Zhongshan, Huizhou, Zhaoqing). In 2002, these 3 big urban agglomeration's basic economic condition is shown as follows.

Table 5-1 Economic comparison of big urban agglomeration

Comparative index	Urban agglomeration of Beijing, Tianjin and Hebei	Yangtze River delta	Pearl River delta
Gross area （sq km）	92743	99698	41698
Gross population（million）	5122	7534	2595
Gross GDP（100million RMB）	7647	16981	8565
Per capita GDP（RMB/person）	14930	22538	33006
Actual amount of foreign funded utilized（US dollars/person）	151	213	547
Per capita fixed investment （RMB/person）	8595	7407	10068
Economic density （10thousandsRMB/sq km）	825	1703	2054
Disposable income of inhabitant （RMB）	8840	10241	10415
R&D/ GDP （%）	10866	19841	18259

Number of hi-tech enterprise of development area	9600	1635	1557
Number of university	157	157	62
Number of academicians	637	220	22

Source: Statistic yearly paper

From the table, we can see the feature of development pattern in these 3 big urban agglomerations. First, Pearl River data urban agglomeration‘s economic development is significant. At the per capita GDP, Actual amount of foreign funded utilized, Per capita fixed investment（RMB/person）and Disposable income of inhabitant（RMB）side, this region is higher than the other two regions. It indicates that Pearl River data urban agglomeration dominates in attracting foreign invest because of it making full use of advantageous condition of reform and opening. But in the aspect of high-tech’s development and R&D, it is lagging behind the other two regions. It just indicates the economic shortcoming in Pearl River data urban agglomeration. This condition will cause adverse effect to further independent development of this region, Secondly, Yangtze River data urban agglomeration is the largest region with the highest population among these 3 regions. It has advantage in the 2 following items, overall GDP and R&D/GDP. It indicates that this urban agglomeration’s economic development is good and makes much of R&D, so this region has further development aftereffect. Thirdly, urban agglomeration of Beijing, Tianjin and Hebei’s development time is 10 years later than Yangtze River data urban agglomeration and 15 years later than Pearl River data urban agglomeration. Compared with the other 2 urban agglomerations, urban agglomeration of Beijing, Tianjin and Hebei‘s number of hi-tech enterprise and number of academicians is much higher than the other 2 regions. It indicates that this region has more aftereffects in the future development if making full use of propellant effect of hi-tech on economic development.

Bohai rime belongs to urban agglomeration of Beijing, Tianjin and Hebei, so its role in the whole nation is similar to this urban agglomeration.

5.2.2.2 Solution for a new-round development of the urban agglomeration of Beijin, Tianjin and Hebei & Bohai rim

ⅰ Integrating into Asia and Pacific region

In order to develop, urban agglomeration of Beijin, Tianjin and Hebei has to integrate into Asia and Pacific region. In the new round Asia and Pacific development, the most potential space is northeast Asia. Korean and Japan is adjusting industry now, so for urban agglomeration of Beijin, Tianjin and Hebei who is just opposite the sea, it is an infrequent good chance. Urban agglomeration of Beijin, Tianjin and Hebei is not only the access connecting northeast Asia and northern china, but also a big market itself. Making full use of its economic complementary with northeast Asia, attracting foreign investment and integrate into Asia and Pacific, its developing space is huge.

ⅱ Going to the western of china

Urban agglomeration of Beijing, Tianjin and Hebei can promote western's development. Firstly, Urban agglomeration of Beijing, Tianjin and Hebei is the place where most commodities' in from western of china. Secondly, with the process of

environment industry, etc connecting together. Besides, Olympic is a big magnetic field that attracts a lot of domestic and foreign brand. Many world famous brands like Matsushita, Three-stars, and Coca cola have signed with Beijing in order to begin a new round of marketing strategy in china by the successful bid for 2008 Olympic Games. Some domestic enterprises like Lenovo group are researching aiming at Olympic Games, just in order to profit from Olympic Games and establish world name brand. Of course, Olympic Game will further improve Beijing's civilization degree and popularity. "Olympic effect" also quickly emerges at Tianjin and Hebei. We can say that 2008 Olympic Game is the turning point of urban agglomeration of Beijing, Tianjin and Hebei.

5.2.2.3 Feasibility of being manufacture base of Bohai rim

Since the end of 1970s, processing trade has achieved quick development. The Development of processing trade stimulated the manufacture power. It contributes a lot to china's economy development and is new road for the progressing of industrialization.

Firstly, processing industry stimulate china's industry structure's upgrading. My country's processing began with labor-intensive industry like textile, closing industry. After more than 30 years' development, industry structure has experienced huge change. The first one is it brings about large number of new products and new technology, hence forming new industry. The second one is that it brings the development of new manufacture industries. The best example is my country's IT industry's development. IT industry is one of industries which internationalization degree is the highest. So it is the most suitable for developing processing industry. The third one is that our country's export structure is improving. Electromechanical product has become the most popular export product. Among these, nearly 90% of electromechanical product's exports are adopting processing trade. Processing trade

improves an enterprise's technology exploitation ability, and promotes technology increase.

Secondly, processing industry has fostered a large number of international types of technology and management persons. From one side, processing industry has fostered large quantity of skilled labor force that is able to adapting to industrial production. For the other side, because of facing international market of processing trade enterprise, processing trade's development brings about a lot of techniques and management persons with ability suitable for international competition. They had experienced by themselves during enterprise's manufacture and operation, so they are quite familiar with the demand for technique and discipline and know about techniques and management in the international market. This young labor force has become the valuable treasure for promoting industrialization.

Thirdly, the development of processing industry will promote industrialization. The development of manufacture industry creates a lot of foreign currency for china and provides necessary condition for promoting industrialization.

On top of that, china's industrialization process need importing large quantity of advanced machine and raw material from foreign country, and also need exporting final products to worldwide. So the construction of international container pivot port should forego.

Bohai rim is the latest development region among 3 big urban agglomerations in the costal region. The processing industry's development brings good effect for china's economy; so in order to develop regional economy of Bohai rim, the best way is to largely develop processing industry. At the same time, this region can speed up the development of regional economy and port construction by interactive development of regional economy, industry structure adjusting and technology upgrading.

5.3 Forecasting of container production of foreign trade within region of influence

5.3.1 Analysis of social economy and industry structure of main provinces and municipalities' hinterland

Tianjin ports' direct hinterland refers to Beijing, Tianjin, Hebei and Shanxi. The indirect hinterland refers to other places within Bohai rim, Inner Mongolia and northwest region of china. Tianjin is a city sprung up because of cannel transport and sea transport. Modern industry sprung up earliest in Tianjin in the north of china. Long history base and favorable location environment make Tianjin a comparative developed all-round processing industry city and main economic center of Huabei region. In 2004, Tianjin completed GDP of 293.188 billion RMB. The characteristic of Tianjin's industry structure is secondary and tertiary industry focused and the industrialization level is high. In 2004, the 3 industries' percentage is 3.5%, 53.2% and 43.3%. Processing industry centered, long industry distance, industry category complete, coexists of traditional and new industries are the features of Tianjin manufacture industry.

Beijin has established a comparable advanced industry structure as china's political, economy and culture center. In 2004, Beijing completed GDP of 606.028 billion Yuan and among it the proportion of 3 industries is 1.6%, 30.6%, and 67.8%. Beijing has already realized the GDP transition of 3 industries from "first industry, secondary industry, tertiary industry" to " tertiary industry, secondary industry, first industry". The process of industry structure's transition is process of economy development. The "tertiary industry, secondary industry, first industry" pattern's forming emblems Beijing's economy has achieved relative high level.

Hebei province is an agriculture-developed city, in 2003, the whole province realized GDP of 709.86 billion Yuan. Among it, the 3 industries' proportion is 12.8%、59.5% and 27.7%. Hebei province is in the period of transition from "secondary industry, tertiary industry, first industry'" to "tertiary industry, secondary industry, first industry". At present, in agriculture, farming take higher proportion while animal industry and cultivating fishery industry are take relative lower proportion. The problem in industry structure is foundation industry's proportion is over large while tertiary industry's structure is lagging, traditional industry's proportion is relative bigger while modern industry is less.

Shanxi province is an industry-developed province. Industry department is leading department. In 2004, the whole province completed GDP of 304.24 billion Yuan. Among it, the proportion of 3 industries is 8.3%, 59.5%, 32.2%.

Table 5-2 History data of Beijin, Tianjin, Hebei, Shanxi region's GDP and Import & Export foreign trade volume.

Tabulation unit: GDP (10 million Yuan)

Trade volume: 10 thousands US Dollars

Year	GDP	GDP	GDP	GDP	Trade Volume	Trade Volume	Trade Volume	Trade Volume
	Beijing	Tianjin	Hebei	Shanxi	Beijing	Tianjin	Hebei	Shanxi
1995	1507	920	2849	1092	530925	654556	392804	140769
1996	1789	1102	3452	1308	539201	829743	420412	134632
1997	2075	1240	3953	1480	577576	1002286	411928	120865
1998	2375	1336	4256	1601	3051738	1061595	422917	111113
1999	2677	1450	4569	1506	3433844	1260465	458038	128739
2000	3161	1639	5088	1643	4962177	1715741	523460	176438
2001	3710	1826	5577	1779	5154131	1817209	573731	194098
2002	4330	2022	6122	2001	5250870	2282700	666700	231197

2003	5023	2381	7098	2445	6846262	2935863	897864	308418
2004	6060	2391	8836	3571	9465509	4204135	1352641	538173
2005	6814	3663	10116	4121	12557127	5330482	1607132	554598

Data source: Arrange on my own according to data in www.stats.gov.cn

According to the history data, we can get the regression equation of every area's GDP and import & export foreign trade volume using Excel. The outcome is shown in Table 5-3. According to Beijing, Tianjin, Shanxi and Hebei's national economic development planning—up to the year of 2010, the four region's economy and social development index will attain the level of medium developed countries and I assume that these regions' annual GDP will increase around 7% from 2007 to 2010. Therefore, we can first get GDP from the year of 2007 to 2008 with the formula 5-1. Then we can get Tianjin's direct hinterland's import & export foreign trade volume by regression equation shown in Table 5-3. The specific outcome is shown in Table 5-4.

Formula 5-1

Year n's GDP= Year (n-1)'s GDP * 1.07

Table 5-3 Regression equation for Beijing, Tianjin, Hebei, Shanxi's GDP

Region	Regression equation	Statistical indicators
Beijing	T= 2099.95*GDP-784865.84	R=0.976439
Tianjin	T= 1780.72*GDP-1222430.26	R=0.995753
Hebei	T= 177.48*GDP-96558	R=0.968216
Shanxi	T= 164.74*GDP-7822	R=0.979175

Annotate: T refers to import and export trade volume. R refers to correlation coefficient.

Table 5-4 Forecast of 4 region's GDP and Import & Export foreign trade's overall volume from 2006 to 2010

Year	GDP				Import & Export foreign trade's overall volume（10thousands US dollars）			
City	Beijing	Tianjin	Hebei	Shanxi	Beijing	Tianjin	Hebei	Shanxi
2005	6815	3664	10116.	4121				
2006	7292	3920	10824.	4410	12526951	5758580	1624506	628629
2007	7802	4195	11582	4718	13598778	6247250	1758981	679480
2008	8348	4488	12393	5049	14745633	6770128	1902869	733892
2009	8932	4803	13260	5402	15972768	7329607	2056829	792112
2010	9558	5139	14188	5780	17285802	7928250	2221566	854407

5.3.2 Foreign trade cargoes' suitable-for-container rate at present and in the future

Though Tianjin port is an all-around big port and is the pivot port of break bulk cargoes and containers cargoes, a large proportion of cargoes like coal and heavy chemical industry cargoes in hinterland is not suitable for container transportation. So in this place, the suitable-for-container rate is respectively low. According to analyzing Beijing, Tianjin, Shanxi and Hebei's international cargoes and referring to the changing condition of Yangtze River region's suitable-for-container goods, we can presume that Beijing, Tianjin, Shanxi and Hebei's suitable-for-container rate will be as follows.

Table 5-5 Suitable-for-container rate of Beijing, Tianjin, Shanxi and Hebei

	Beijing	Tianjin	Shanxi	Hebei
2007	62.5%	63.2%	35.4%	49.5%
2008	62.9%	63.7%	35.9%	49.9%

2009	63.3%	64.3%	36.2%	50.4%
2010	63.8%	64.9%	36.7%	50.8%

5.3.3 Composite coefficient, packing rate, the weight of loaded container and the rate of loaded & empty container

Composite coefficient (R—10thousands tons/100million US dollars) indicates that the weight of suitable-for-container cargoes produced by every 100million US dollars 'import and export overall volume. According to the report of Tianjin port's overall planning—forecast of Tianjin port throughput's development made by ministry of transport and considering the influence of changing structure of Tianjin port's hinterland to high value-added product's proportion, we assume that from the year of 2007 to 2010, the container transportation's R is 4.2 in Tianjin port.

According to the report of Tianjin port's overall planning—forecast of Tianjin port throughput's development made by ministry of transport, in recent years Tianjin port's direct hinterland's international suitable-for-container cargoes' packing rate would be around 70%. Referring to the changing of packing rate for international suitable-for-container cargoes brought by the changing of industry structure in Yangtze river data region, I assume that from the year of 2007 to 2010, Tianjin port's direct economic hinterland 's international suitable-for-container cargoes would be 72%, 74%, 76% and 78% respectively.

According to the statistic materials of Tianjin port, in recent years the weight of a loaded container is around 14 tons. The proportion of loaded container to empty container is around 75%. Referring to the changing condition of a loaded container's carrying capacity in shanghai port, we assume that from the year of 2007 to 2010, the

weight of a loaded container would be respectively 13.5 tons, 13 tons, 12.5 tons and 12 tons in Tianjin port.

5.3.4 Container production for foreign trade cargoes

The expression of every area's container production in the next few years is shown in Formula 5-2.

Formula 5-2

Container production=import & export's overall volume*suitable-for-container rate*composite coefficient*loading rate / (loaded container's carrying capacity*the proportion of loaded container).

According to the above expression we can get Beijin, Tianjin, Hebei and Shanxi's container production from 2007 to 2010. The outcome is shown in Table 5-6.

Table 5-6 Container production Prediction of Tianjin port's direct economic hinterland from the year of 2007 to 2010

Tabulation unit: 10 thousands TEU

Year	2007	2008	2009	2010
Beijing	254	296	344	401
Tianjin	118	137	160	187
Hebei	19	22	25	30
Shanxi	10	12	14	16
Total	400	467	544	634

According to previous statistic materials of Tianjin port we can know that Tianjin port's indirect hinterland's international container production roughly accounts for 14% of overall international container production. So basing on the above calculation

we can predict Tianjin port's indirect economic hinterland's container production from 2007 to 2010 according to the Formula 5-3 and overall international container production according to Formula 5-4. The outcome is shown in Table 5-7.

Formula 5-3

Indirect economic hinterland's container production = Direct economic hinterland's container production / 0.86 * 0.14

Formula 5-4

Total international container production= Direct economic hinterland's container production + Indirect economic hinterland's container production

Table 5-7 Prediction on Tianjin port's economic hinterland's international container production from 2007 to 2010

Tabulation unit: 10 thousands TEU

Year	International container production of Tianjin port's direct economic hinterland	International container production of Tianjin port's indirect economic hinterland	Total
2007	400	65.18	465
2008	467	75.95	542
2009	544	88.5	632
2010	634	103.24	737

5.3.5 Tianjin port's container throughput from 2007 to 2010

According to previous statistic materials of Tianjin port, Tianjin port's International container throughput roughly accounts for 75% of overall throughput. So now we can predict Tianjin port's internal container throughput and overall container

throughput according to Formula 5-5 and Formula 5-6. The specific outcome is shown in Table 5-8.

Formula 5-5

Overall container throughput= International container throughput/0.75

Formula 5-6

Internal container throughput = Overall container throughput – International container throughput

Table 5-8 Prediction on Tianjin port's container throughput from 2007 to 2010

Tabulation unit: 10 thousands TEU

Year	International container throughput	Internal container throughput	Overall container throughput
2007	465	155	621
2008	542	180	723
2009	632	211	842
2010	737	246	983

5.3.6 Container production considering of distribution

There are 3 ways of cargoes transported to Tianjin port. That is by rail, by road and by sea. The throughput of containers transported by rail and road is equal to the transportation volume. But the throughput of containers transported by sea is 2 times more than the transportation volume. That means if 1 container is transported by sea, 2 TEU will be produced. Considering of this situation, this part of container production distributed by sea should times 2. But because of terrible inner river condition in Tianjin port, most of cargoes are distributed by road and rail. In order to

simply my prediction, I assume a distribution index. Multiplying it we can get the real container throughput considering of distribution. Here I assume that the distribution index is 1.05. So container production transported by sea is circulated according to Formula 5-7 and Table 5-9 shows Tianjin port's container production considering of distribution.

Formula 5-7

Container production considering of distribution= Overall container production * Distribution index

Table 5-9 Tianjin port's container production considering of distribution

Tabulation unit: 10 thousands TEU

	Overall container production	Distribution index	Container production considering of distribution
2007	893	1.05	652
2008	997	1.05	760
2009	1138	1.05	885
2010	1299	1.05	1032

Chapter 6 Tianjin port's container development strategy

6.1 The objective of Tianjin port's container development—

International shipping center and China's north container pivot port

With Tianjin Binhai new district's exploit and construction been brought into china's 11th 5-year-plan and china's program layout of development strategy, the construction step of bringing Binhai new district to china's north container shipping center and international logistic center is faster. As an important component of Binhai new district, Tianjin port's construction is also growing fast. Up to 2010, Tianjin port's throughput will reach 300 million tons. The port will reach 300.000 DWT and have the capability of berthing most advanced container ships in the world, mainstream bulk carriers and most advanced international oil ships. Such clear objective is just for the purposes of let Tianjin port become an exact international shipping center and international logistic center.

6.2 The rationality analysis of establishing Tianjin port as international container pivot port

In chapter four's analysis, we know that Tianjin port has a lot of advantage for becoming international shipping center. For example it is the biggest all-around port in the north of china, it has been paid great attention by government at all times, it owns favorable port condition and the infrastructure construction developed quickly.

As for its disadvantage, the first disadvantage is that circumjacent port's large scale and specialization tendency is increasingly apparent. Though both Dalian port and Qingdao port is competing with Tianjin port seriously, in my opinion, the biggest competitors are not them but Pusan port. It is Pusan port that scrambles for transferred cargoes. But the recent throughput capability of these 3 ports is still very small compared with Pusan port. So a large quantity of cargoes should be transshipped at Pusan port. Port construction of the three ports will make throughput capability increase quickly. If the throughput capability is enough, the transferred cargoes will be retained. Also, because of shipping industry exist Matthew effect, the port construction of 3 ports will benefit any of these three ports because of more cargoes will be attracted here. The second disadvantage is that the berth needs further construction. This problem has been greatly improved in recent years and before the year of 2011 16 deep-water container berths will be built. At that time, Tianjin port's berth problem will be solved. The 3rd disadvantage is that it is farther to world major route compared with Dalian port and Qingdao port. About it, we can look at it from another view, though it is farther to major route, it is closer to the hinterland. It can better receive the cargoes from north of china. The left 3 disadvantages are respectively unsound transportation network, unsound port operation management mode and unsound information management. All of these three problems can be improved and solved by effort.

According to chapter 5's forecasting, we can see that Tianjin port's container throughput will reach more than 10 million TEU in 2010. Large quantity of container cargoes provides guarantees for Tianjin's international shipping center's construction. At the same time, in 2010, Tianjin port's container throughput capability will be 12 million TEU. The supply satisfies the demand. Therefore, the oversea transit cargoes will drop greatly. By contrast, it may attract some portion of transit cargoes. It is beneficial for Tianjin port's international shipping center's construction.

6.3 Strategy of Tianjin port

6.3.1 Construction strategy of Tianjin port

In order to realize the “international shipping center and international logistic center”, during the 11th five-year-plan, Tianjin port will invest more than 30 billion Yuan to construct ports. There are 10 major projects. Among these, the projects concerning to the container transportation are as follows. The first one is that for the purpose of adapting to the bigger tendency of ships, Tianjin port will construct 250.000 DWT deep waterway engineering project. 250.000 DWT deep waterway will make 300.000 DWT mainstream bulk carrier go in and out of the port freely and can berth the biggest container ships in the world and modernist oil ships at any time of day. The second one is on the basis of 13 container berths in 2005, north port district and east port district will establish 16 large container berths, and the new adding container throughput capability will be 8.2 million TEU. In the year of 2010, Tianjin port’s container throughput capability will reach 12 million TEU and a container terminal cluster will form which adapts to the development of north international shipping center. The third one is in order to add international transit cargoes, speed up the construction of bounded port project in east port district. Relying on east port district’s geography environment and location advantage, establish it a bonded port with the highest open degree and make it have the function of port, export processing, import bonded, export tax reimbursement. By doing this, Tianjin port will have more international transit cargoes.

6.3.2 Cooperative competition strategy of Tianjin port

6.3.2.1 Cooperate in the competition

ⅰ From the strategic meaning of cooperate at competition, strengthening cooperation between ports within Bohai rim is not only for every ports’ benefit but also the demand for adapting international shipping market competition and improving the

every ports' competitive power in Bohai rim. Look at the world famous ports in the world, almost all of them are looking for nearly ports to cooperate. For example, New York port and New Jersey combined to NY/NJ combined port. Los angles and Long beach combined to LA/LB combined ports. The trend of economy globalization and shipping alliance demands ports establishing cooperation strategy. With the gradual increasing of shipping alliances and global services' spread, large shipping companies extend global services by merging, purchasing and alliance. Liner companies have more capability in market dominating. They can choose which port to call. Some powerful shipping companies can negotiate with port authority to get more favorable port service price. For a port, losing one shipping company's calling will lead to large quantity of throughputs' lost. So in order to increase Tianjin port's negotiating power and competitive power, it should cooperate.

ii Ports have their distinct industry characteristic. The construction investment of ports is very huge and among this fixed investment takes the major proportion. The construction circle is long and their products is mainly service which has natural scale efficiency and social efficiency. This characteristics lead to ports has specific "pursuing for monopoly" characteristic. So strengthening cooperation in port industry seems more important than other industries.

iii Tianjin port should adopt cooperation and win-win strategy with its domestic competitors within Bohai rim. A port's competitive power to a large extent affected by its competition strategy it has chosen. At present, the ports within Bohai rim are competing very seriously. There still hasn't formed effective regional cooperation yet. In order to become the north container pivot port, most of ports prefer to cooperate with far port but the ports within Bohai rim. The end result of this behavior is that the service fee and profit drops. Obviously, this result is not beneficial to any ports within Bohai rim. So I can say that without effective cooperation, Tianjin port's objective—international shipping center will be even more difficult to realize. Ms liu zhuwei refers in her article port industry—competition and win-win strategy that as

for cooperation, there are 2 kinds of cooperation. One is tactic cooperation. The other is strategic cooperation. Tactic cooperation is suitable for ports that are quite near and can complement in natural condition and throughput. Strategic cooperation is suitable for big ports[13]. I think its opinion has some reference for Tianjin port's development and Tianjin port can adopt this 2 kinds of cooperation for different nearby ports. In the north of Tianjin port, there are caofeidian port, jingtang port and qinghuangdao port. In the south of Tianjin port there is huanghua port. Under the recent situation, every port has its own strength. So Tianjin port can adopt cooperation and win-win strategy with these nearby ports and make full use of every port's comparative advantage and make up Tianjin port's disadvantage. The cooperation can be realized by forming close economy associated entity by exchanging stock ownership or acquiring stock ownership. After cooperation, the ports can reasonably deploy cargoes, adjust port fee together and improve operating and logistic efficiency. Cooperating can improve Tianjin port's competitive power quickly and cheaply. As for Dalian port and Qingdao port, Tianjin should adopt strategic cooperation with them. Just as what I have said in the previous chapter, the biggest competitors of Tianjin port are not Dalian port and Qingdao port. It is Pusan port and Kobe port. So the 3 north big ports should not take each other as biggest competitors. Tianjin port should cooperate with Dalian port and Qingdao port by the form of industrial association, lay down industry regulation, safeguard the whole industry's profit, avoid vicious competition and improve overall competitive power of Bohai rim port cluster. It will not only benefit Tianjin port's development but also will be beneficial for Bohai rim port clusters' development into international shipping pivot port cluster in the northeast Asia. At present time, all of Tianjin port, Qingdao port and Dalian port's strength are almost the same. Who will become the leader? It is not only decided by port's throughput and scale, the ability to integrate nearby ports, handle market and manage ports is also quite important. So Tianjin port should also take effects on strengthening the ability of these aspects at the time of speeding up the port construction.

[13] Liu zhuwei, 2004.4.6

6.3.2.2 Compete in cooperation

Because different ports within Bohai rim have their different strength, after cooperation, ports should consider the problem of how to compete. Because there is the premise of cooperation, competition should be ordered at the same time. As for Tianjin port, because there is the premise of cooperation, the focus of competition should be on service, quality, efficiency, cost and management. Which port has best service, best quality, highest efficiency and lowest cost and which port will get more customers and become the container pivot port.

6.3.3 Talent cultivating strategy

Nowadays, port's automation level is improving quickly; the persons needed in port are less then before. But the demand for person's qualification is higher and higher. In the future, the competition between ports to the certain degree is competition between people. So improving the qualification of persons is quite important in nowadays' port competition.

6.3.3.1 The objectives of talent cultivating strategy

The general thinking of talent cultivating is talent's development should comply with enterprise's development strategy and arranged purposefully and planned. The enterprises should have talent consciousness and gradually adjust the complementary relation among "environment change—strategy positioning—talent demand". The objectives of talent cultivating in Tianjin port is first explore and foster talent and then establish a set of complete talent motivation mechanism and talent flow mechanism.

6.3.3.2 The design of talent employing strategy

In the future, there will be a lot of construction projects. Tianjin ports need to have talents who know projects construction management as well as projects construction. At the same time, Tianjin port should speed up fostering operating management talents and persons who are good at logistic transaction, English and computer. The specific design is as follows

i Strengthen the training on employees.

ii Renewing the conception of using personnel

Avoid the “close breeding” phenomena that lead to personnel’s overall qualification drop. Recruit personnel according to demand but according to relation or affection.

iii Study form foreign companies’ strategy, adopt “not owned by my company but used by my company” strategy. If there exist the person-lacking problem, recruit excellent talent from other companies.

6.3.3.3 Personnel motivation mechanism

Establish a set of complete motivation mechanism and make every employees are motivated. The motivation format can be diversified such as wages, praise, good opportunity and such like that.

6.3.4 Port service’s multivariation and logisticslization strategy

With port scale’s enlarging, transportation technology’s progress and international business ‘s development, port function has transferred to logistic service zone and international logistic base basing on information. Port has become the organic connecting point in the regional and international economy circle. Modern ports is not only the necessary components of nowadays’ transportation network, but also the important resource of modern logistic development. With the spring up of the new

generation port, port service's multivariation and overall port services have become the basic condition of modern port's survival and development. All-areas and all-round logistic services needed by economy central cities' development have become the major service contents of modern ports. So ports have become the nerve center of regional logistic organization. The serious market competition between ports have focus on the facts that whether ports can provide convenient, fast, low-cost, reliable and all around logistic service. Therefore, in order to improve competitive power, Tianjin port should also speed up the construction of port logistic.

Conclusion

The development of container transportation brings about the revolution of transportation methods. Under the new shipping competition pattern, competitions between ports are more and more serious. Among the ports in northern china, Tianjin port, Dalian port and Qingdao port are most powerful but compared with container pivot port, there is still a long way to go. Port‘s throughput capability even cannot satisfy the container production from hinterland, not to mention attracting transshipment cargoes. Transferred at oversea phenomena is very serious which largely reduce the north port’s competition power. Therefore, it is quite necessary to construct a container pivot port in the north of china to change this kind of disadvantage situation. Tianjin port is the biggest all-around port in northern china. Compared with other ports, it has favorable geography location, vast economic hinterland, powerful city influence and better government focus. So Tianjin port is more qualified to construct container pivot port. According to the research on Tianjin port’s direct economy hinterland—Beijing, Tianjin, Hebie and Shanxi, I forecast the container production of Tianjin port from the year of 2007 to 2010. The outcome is about 10 million TEU in 2010. Tianjin port’s favorable economy condition and sufficient cargoes resource prove that it is feasible to establish Tianjin port as container pivot port. But only sufficient cargoes and government support is not enough. Tianjin port’s own condition is also quite important. According to forecast, the biggest container is going to reach 12000 TEU. Bigger container needs longer container berth. At previous, the berths are shorter than 300m. But now, berths should be much longer than before. An 8000 TEU vessel needs a 350m long berth and a 12000 TEU vessel needs a 400m berth. Besides, ports should guarantee the 16-17m’s minimum water depth. In recent years, Tianjin port is largely developing port

infrastructure construction and is gradually stepping into the range of world's deep-water ports.

Summing up Tianjin port's current condition, other major port's managing situation and connecting Tianjin port's container production, I summarize several development strategies for Tianjin port. The first one is Cooperative Competition Strategy. Tianjin port should strengthen the capability to integrate nearby ports, handle market and manage ports basing on competition. The second one is Talent Cultivating Strategy. In the future, the competition between ports to the certain degree is competition between people. So improving the qualification of persons is of great importance in nowadays' port competition. The third one is Port service's multivariation and logisticslization strategy. At present, ports have become the nerve center of regional logistic organization. The serious market competition between ports has focused on the facts that whether ports can provide convenient, fast, low-cost, reliable and all around logistic service or not. So, Tianjin port should also speed up the construction of port logistic. By doing all of these, I am sure Tianjin port will realize its aims and become the international container pivot port one day.

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